

THE GOVERNMENT PULSE

ENVIRONMENT

The 'Clean Industry' Has Some Cleaning Up to Do

By Martha M. Hamilton
Washington Post Staff Writer

Some time during the 1970s, a chemical linked to cancer in animals seeped into the ground at IBM's manufacturing plant in Manassas, Va., and began to trickle toward a large underground lake that provides drinking water to 32,000 people within three miles of the site.

The chemical was tetrachloroethylene, or perchloroethylene, a common industrial and dry-cleaning solvent generally regarded in those days as relatively safe. It was used to clean semiconductor parts.

In 1981, as part of its corporate pollution control program, IBM discovered that leaks had occurred, notified authorities and began taking steps on its own to contain the problem. Old tanks were shut down, new handling procedures were established, contaminated dirt was excavated and removed, and the company began digging wells to trace the progress of the contaminant and testing nearby drinking wells.

So far, apparently, no drinking water has been contaminated, nor is there any evidence that the pollution is in ground water anywhere except under the IBM site. IBM itself gets its water from another source, and nearby drinking water wells have shown no traces of the chemical. In addition, the IBM plant sits atop relatively impermeable clay and shale through which the contaminant moves slowly.

Even so, as long as the chemical is in the ground water, it remains a potential health threat, according to state health officials. Earlier this month, the Environmental Protection Agency added the IBM site to a "national priority list" of hazardous waste sites for "Superfund" cleanup, along with other computer manufacturing sites.

IBM's inclusion on the list—along with 19 manufacturing sites in Santa Clara County, Calif., in the heart of the Silicon Valley—may not be cause for immediate concern among the people who live near the Manassas site. There is a 60-day comment period during which IBM hopes to convince EPA that it doesn't belong on the list—a view shared by some state and local officials.

But it is symptomatic of a problem that is registering on the national consciousness almost as slowly as ground water trickles through shale.

The electronics industry—particularly semiconductor manufacturing—once hailed as the "clean" industry of the future and eagerly courted by cities and counties across the country, is not so clean. The problem is becoming a major issue in California, where such plants are concentrated and where sandy subsoil has allowed an array of chemicals to seep into the ground water.

"It's just galling to us to see the way that everybody is giving away the kitchen sink to buy into this industry without understanding the downside," says Ted Smith, an attorney who heads the Silicon Valley Toxics Coalition. "We were sold a bill of goods 20 years ago by this 'clean industry' garbage.

"Not only is it a chemicals-handling industry, these are some of the most exotic chemicals and dangerous chemicals around," he says. "And it's not just the solvents. They use acids and they use gasses, and some of the most dangerous are the gasses."

EPA lists electronics plants as hazardous waste sites

"The problems of health and safety in the semiconductor industry present a major challenge to both the industry and the communities in which it provides jobs and other economic benefits," Joseph LaDou wrote recently in Technology Review, a Massachusetts Institute of Technology publication.

LaDou, chief of the division of occupational and environmental medicine at the University of California School of Medicine in San Francisco, has been particularly concerned with worker health and safety in the semiconductor industry.

In terms of worker illness caused by systemic poisoning or exposure to toxic chemicals, the industry is quite hazardous, although its overall accident rate is relatively low, he said. According to LaDou, for all manufacturing, the work-loss rate from systemic poisoning is 1.5 cases per 100 workers. For electronics, it is six per 100 workers, and for the semiconductor-manufacturing component of that industry, it is 9.5 cases per 100 workers, he said. Those rates compare with rates of 1.6 for mining, 2.1 for agriculture, 2.8 for chemicals and allied products, and 5.9 for petroleum and coal products.

"What you've got on the one hand is this sort of myth that a clean industry means that a worker is not exposed to toxic materials," LaDou said. "But what we've really learned is that protecting the microchips from dust has no value to the worker."

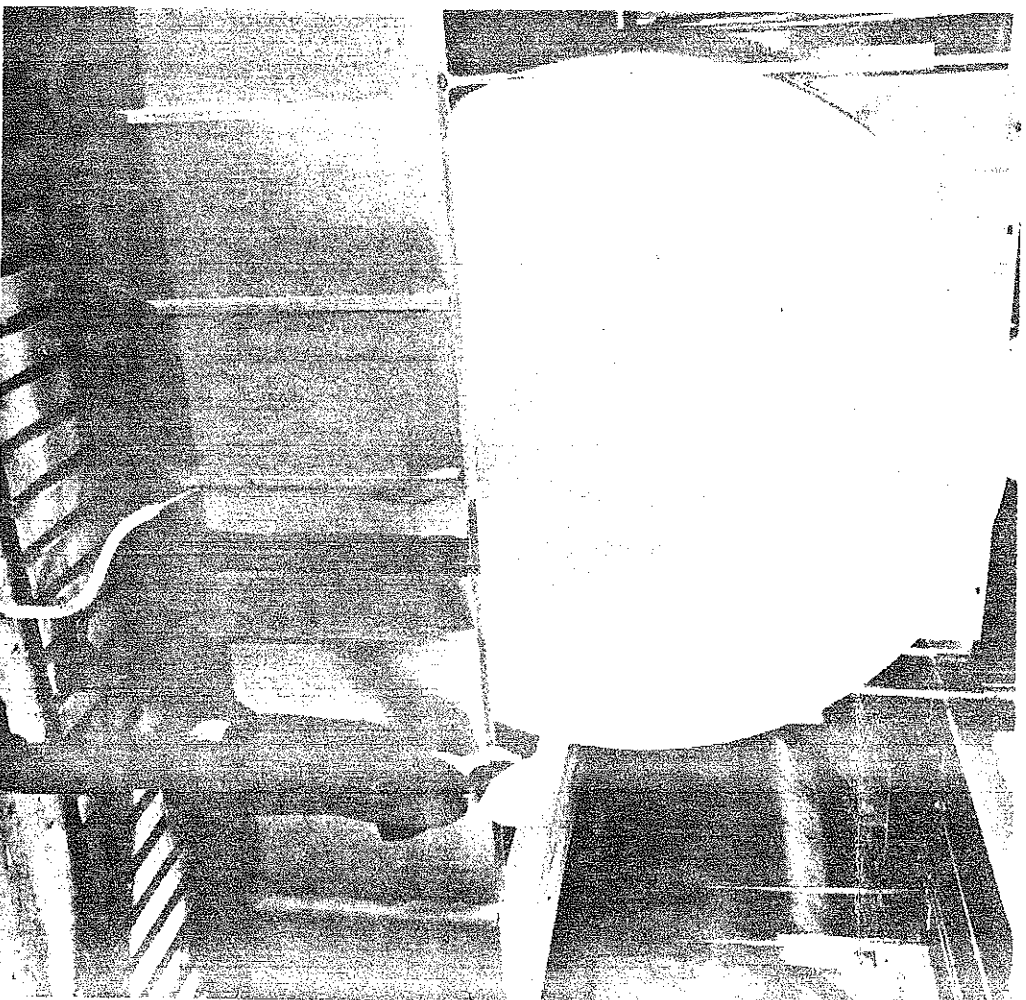
EPA lists electronics plants as hazardous waste sites

There is debate over some of the figures used to quantify the problem, according to Megan Taylor, director of the Industry Clean-Water Task Force in California. But the electronics industry concedes that there is a problem and has formed Taylor's group as one approach to dealing with it.

"There is a growing awareness that there are some very hazardous chemicals used in these production processes, but they can be managed so they don't pose a hazard," Taylor says. She adds that the growing numbers of reported incidents of pollution in the industry may reflect a high degree of monitoring, not that the industry is a heavy polluter.

BM was one of the first companies in the Silicon Valley to discover that it had a problem, Taylor says. In California, as in Virginia, IBM generally receives high marks for its handling of the problem, which has included spending about \$20 million, according to Taylor and others. "They have jumped on it, and some other companies have not," says Smith, of the Silicon Valley Toxics Coalition.

With the revelation of leaks of hazardous substances came a growing recognition that underground storage of hazardous materials presented problems, Taylor says. Storage has begun moving above ground, giving electronics manufacturing a more industrial, less campus-like look but making it cheaper and easier to monitor for possible pollution.



An IBM engineer checks a chemical holding tank with an outer bin as a safeguard.

By John McDonnell—The Washington Post

Santa Clara County developed a model ordinance for regulating the storing of hazardous material. The ordinance was the basis for the state law and has been proposed by Rep. Norman Y. Mineta (D-Calif.) at the national level. It requires monitoring of underground storage and requires that new storage facilities offer "double containment" (one container inside another) for extra protection.

IBM in Manassas is building above-ground storage tanks contained in another vessel as part of a new chemicals-handling facility. Collection tanks, which once held materials prior to waste treatment and which appeared to be the source of one of two leaks, were removed. IBM put pipes carrying hazardous substances into concrete vaults. The vaults prevent any leaks into the ground. Within the vaults, the pipes are monitored for leaks, so that any found can be quickly repaired.

"I'm always protected. It can't get out of my trench," says Gene Naughton, manager of facilities engineering at Manassas.

IBM has found itself in a situation similar to that of other industries, discovering that a widely used chemical had unforeseen possible health consequences. Perchloroethylene was "undammable and it attacked grease, so all your mechanics used it to clean tools, to clean floors," Naughton says. "It wasn't on anybody's list. It was a friendly chemical."

It is now on EPA's list. EPA has proposed recommended maximum contaminant levels for nine chemical compounds that might cause health problems if they are found in drinking water at significant levels. The proposal represents the first effort under the Clean Water Act to set enforceable standards for the chemicals, including tetrachloroethylene.

Perchloroethylene, the chemical discovered in Manassas, has been found to cause tumors in mouse livers and may be a carcinogen, according to the EPA. In extremely large doses, the chemical can cause central nervous system depression, fatty infiltration of the liver and kidneys, and tissue damage.

The suggested allowable levels are 2,300 parts per billion (ppb) for a one-day exposure, 175 ppb for 10 days and 85 ppb for daily intake. At IBM's Manassas facility, the chemical has been found in amounts up to 250 ppb. "The large majority of our tests are below 100 ppb," says Bob Henshaw, a spokesman there.

IBM is conducting tests to determine the flow of ground water in the area to help contain the problem. The chemical has been found within about 10 feet of IBM's property line. No private wells nearby have been found to be contaminated.

IBM, state and federal officials are still discussing how best to remove the contaminant from ground water. Spraying water in the air is one possibility, according to the EPA. Water containing this type of contaminant may also be cleaned by passing it through charcoal filters, EPA officials say. The expensive part is extracting the water from the ground.

While IBM grapples with this problem, "there's probably some very 'friendly' chemical around today that we'll have problems with 20 years from now," Naughton says.